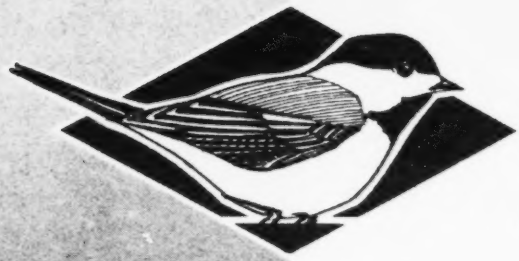

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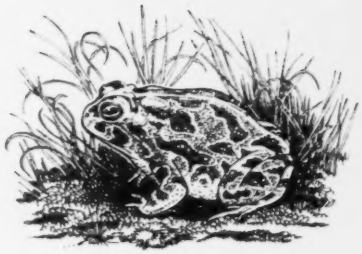
Alberta Amphibian Call Surveys
A Pilot Year
Final Report



Alberta Species at Risk Report No. 53

Alberta
SUSTAINABLE RESOURCE DEVELOPMENT

Alberta Amphibian Call Surveys

A Pilot Year

Final Report

Lisa Takats
and
Chuck Priestley

Alberta Species at Risk Report No. 53

April 2002

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EXECUTIVE SUMMARY

Call surveys using the North American Amphibian Monitoring Program (NAAMP) protocol were conducted in the summer of 2001. The goal was to determine whether the NAAMP protocol was a useful technique in monitoring amphibian populations in Alberta, and if so, to initiate a volunteer-based survey. Forty-one transects and 22 point counts were established and surveyed throughout Alberta. Amphibians were heard at 55% of the point count stations and on 187 stations (37.6%) along the transects (n=497 stations). Species recorded included: western toad, Canadian toad, Great Plains toad, plains spadefoot, boreal chorus frog, wood frog, Columbia spotted frog, and northern leopard frog. More amphibians were recorded in forested areas than in prairie regions. Environmental conditions (wind speed, temperature, time of night) had an effect on detection rate (number of active stations/total number of stations surveyed). Ground truthing (46 ponds along 18 transects) revealed that call surveys are a good technique for determining presence of species that are more common. Rare species were not effectively monitored, however more work should be conducted during years when rain events are more common, to collect more information on the effectiveness of the survey protocol. Call surveys will be conducted in 2002 through Bird Studies Canada Marsh Monitoring Program.

1.0 INTRODUCTION

The Alberta Amphibian Call Survey was initiated because of a need for information on current and long-term population trends and distributions of the amphibians of Alberta. Recently, numbers of some amphibian species have been declining throughout the world, and while some amphibian species numbers are currently stable, biologists are uncertain if this trend will be maintained. Although there is growing concern that amphibian populations are declining globally (Blaustein *et al.* 1994, Wake 1991, Blaustein and Wake 1990), much of the supporting evidence is either anecdotal (Wake and Morowitz 1991, Pechmann and Wilbur 1994) or derived from short-term studies at small geographical scales (Lips 1998, Harte and Hofman 1989, Corn and Fogleman 1984). This highlights the difficulty in detecting temporal trends in populations which are notoriously variable. Additionally, many biologists believe there are several factors that may be causing the decline of amphibian populations, rather then any one single factor. These include:

-the elimination of quality habitat caused by the draining of wetlands for urban and/or industrial developments and agriculture,
-reduction of breeding and over-wintering habitats by irrigation practices and dams,
-the degradation of water quality through the input of pesticides, herbicides and other chemicals,
-increased levels of ultra-violet light (UV) which may negatively affect the eggs and larvae of some species,
-the alteration of shoreline and upland habitat by livestock, farming and certain recreational activities, and
-diseases and pathogens, either introduced, or exacerbated by the above problems.

Most male frogs and toads, in the reproductive condition, use distinctive calls to attract mates (Wells 1977, Stebbins and Cohen 1995). Call surveys exploit this behavior, and information can be collected on the various species that are calling. This method can be used to determine species composition, relative abundance, breeding habitat use, and map distributions (Heyer *et al.* 1994). Call surveys have the potential to show population trends and distribution trends of amphibians.

The United States Geological Service (USGS) first discussed the concept of a North American Amphibian Monitoring Program in 1994. The initial protocols were based on Breeding Bird Surveys (BBS), a roadside listening survey made up of equally spaced stations placed along transects. In 1997, a statistically significant (and defensible) protocol was written, and some agencies initiated monitoring. Finally, in early 2000 meetings were held to create a final unified protocol which included, required, flexible and optional sections. At a January 2001 meeting in Nashville, TN, Canada (represented by Lisa Takats, Alberta Conservation Association) was asked to join the monitoring program.

The Alberta Endangered Species Conservation Committee recommended a designation of *Data Deficient* for the Canadian toad (*Bufo hemiophrys*) and the Great Plains toad (*Bufo cognatus*) indicating that there is not enough information to determine populations trends and status. The plains spadefoot (*Spea bombifrons*) *May Be At Risk* and there is limited information on their populations in the province (Alberta Sustainable Resource Development 2001). Data collected during call surveys may provide additional distribution information on these species, as well as provide information on population trends.

The goal of this study was to determine whether an amphibian call survey is an effective method for collecting distribution and population size information on amphibian species in Alberta. If this survey method proves effective, implementation of a long-term volunteer survey may be considered. Previously, one pilot year of call surveys was conducted in Alberta, and implemented by consulting companies and the Canadian Wildlife Service. Conducting the surveys in areas where amphibian populations have been inventoried in the past will also test the effectiveness of call surveys. Researching Amphibian Numbers in Alberta (RANA) sites have been surveyed for the past five years (Takats 2002a, 2002b), and would serve as suitable comparison sites.

The objectives of this study were to:

1) Test the call survey method outlined by the NAAMP to determine how effective it is for documenting amphibian species found in Alberta, and
2) To collect distribution and abundance information on three focal species (Great Plains toad, plains spadefoot, and Canadian toad).

2.0 STUDY AREA

Call surveys were conducted throughout Alberta. Random transects (routes) that focused on Canadian toad, Great Plains toad, and plains spadefoot, were conducted south of the North Saskatchewan River and east of 114° Longitude. Map sheets were randomly chosen within this region, and a transect was located on a randomly chosen road within each map sheet. The routes started at a major intersection to ensure they could be repeated accurately in the future. A second transect was selected within the map sheet, or adjacent map sheets that covered historic Canadian, Great Plains, and/or plains spadefoot toad sites. This enabled one surveyor to survey two transects in one night. Volunteer call surveys were conducted at Athabasca (two surveys) and La Crete (one survey). Three RANA sites (Kananaskis, Hinton, and Cypress Hills) also had volunteer surveyed transects.

3.0 METHODS

3.1 Transect Selection

The basic survey method consisted of listening for calling amphibians along a predetermined route consisting of a minimum number of evenly spaced stations (Ralph and Scott 1981, Bibby *et al.* 1992). This technique lends itself to large-scale surveys where the intention is to obtain data that can be analyzed at a regional or larger scale. In order to minimize the possibility of duplicating individual amphibian detection on multiple routes, transects were separated by at least 5 km (Anderson *et al.* 1979). Stations were placed 0.8 km apart to maximize area sampled and minimize travel time between stations. Point counts were also conducted at ponds en route to the transects.

Call surveys were initiated in May when calling amphibians were first heard, and continued through June and July, 2001. The southern prairie transects were surveyed when there were reports of heavy rainfall for a few days in June. Routes were set along roads with limited traffic (for safety reasons and so traffic noise did not impede the researchers' ability to hear amphibians calling). Roadways had variable widths.

3.2 Call Surveys

Call surveys began 30 minutes after sunset or later and were completed by 1:00 a.m. (USGS 2001). The surveys were conducted in close to ideal environmental conditions (wind at level 3 or less on Beaufort Scale, not during heavy rainfall, and at temperatures close to the average for the season). Datasheets were filled out for each survey that was conducted, which included information on species detected, abundance, and environmental conditions (wind, temperature, sky conditions) during the survey (Appendix A).

3.3 Ground Truthing

Once the call survey season ended (post-optimal breeding call period) transects were revisited during the day so that ponds could be surveyed visually. Surveyors walked the perimeter of each pond at both the edge, and about 20 feet from the edge. Data collected at this time included: location, weather conditions (wind on the Beaufort scale, cloud cover, and precipitation), species, number and age (adult, young-of-year, juvenile, eggs, larvae) of all amphibians observed, and a brief habitat description. Photographs of the sites were also taken.

3.4 Analysis

All data collected were stored electronically in the Biodiversity/Species Observation Database (BSOD) which is maintained by Alberta Sustainable Resource Development. Data were also stored in Excel spreadsheets including the environmental data that was collected. Detection rate was calculated for each species (number active stations/total number of stations visited). Environmental conditions (wind speed and temperature) were examined to determine if they affected detection rate. Times that the surveys were conducted were divided into two hour time frames for transects surveys, and four hour time frames for point counts (larger time frames because there were so few point counts for analysis).

4.0 RESULTS

4.1 Call Surveys

4.1.1 Point Count Stations

There were 22 point count stations surveyed (Figure 1, Appendix B) and three species of amphibians were detected on 12 stations, with one station having two species. Species heard calling included: boreal chorus frog (*Pseudacris maculata*), wood frog (*Rana sylvatica*), and plains spadefoot (Table 1). Amphibians were not detected at 10 points (45% of the point counts).

Table 1. Number of point count stations where amphibians were heard by species.

Species	**Number of Stations Surveyed**
Boreal Chorus Frog	11
Wood Frog	1
Plains Spadefoot	1
Total	**12**

4.1.2 Transects

Forty-one transects were surveyed (Figure 1, Appendix C):

-30 survey routes were set randomly,
-volunteers conducted two call surveys routes near Athabasca, and one near La Crete, and
-eight call survey routes were conducted in RANA regions (4 Hinton, 3 Kananaskis, 1 Cypress Hills) where, based on visual surveys, known populations of amphibians occur.

Nine of these transects were visited twice (total of 497 stations). Amphibians were recorded at 190 stations (38.2%). Only three transects had no amphibians recorded on them. Eight species of amphibians were recorded including: boreal chorus frog, wood frog, Canadian toad, Great Plains toad, plains spadefoot, western toad (*Bufo boreas*), Columbia spotted frog (*Rana luteiventris*), and northern leopard frog (*Rana pipiens*) (Table 2, Appendix D).

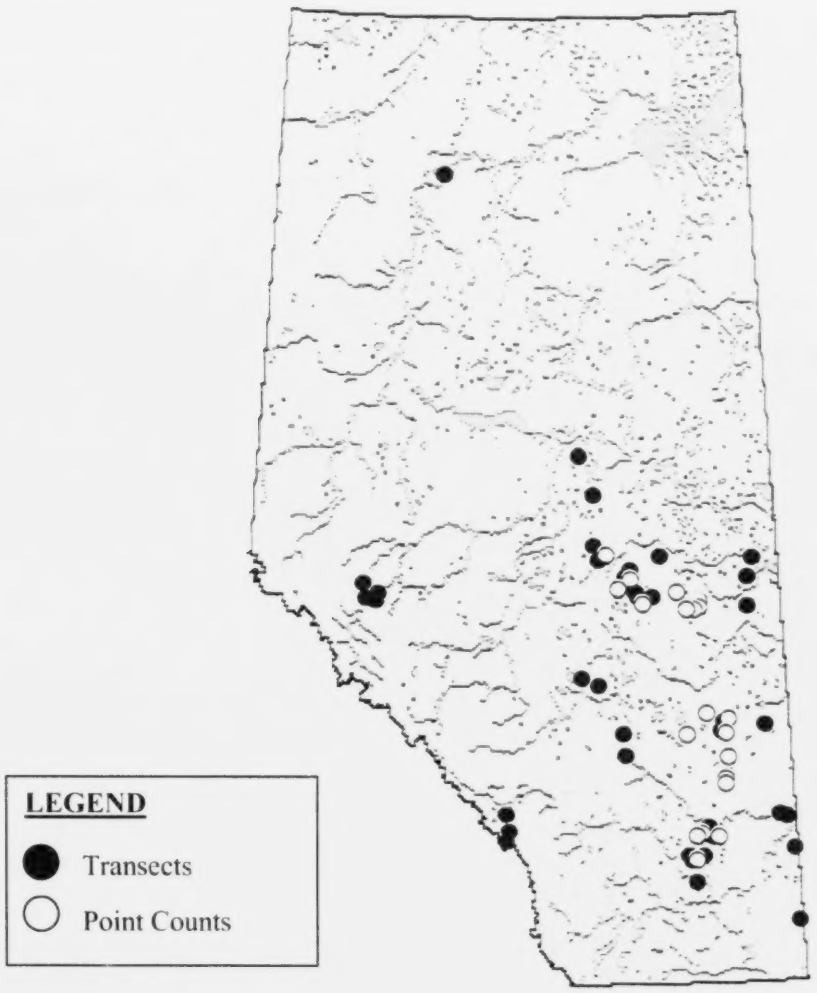

Figure 1. Map of transects and point counts that were surveyed for amphibians in 2001.

Table 2. Number of stations (out of 497) and number of transects (out of 41) where amphibians were heard.

Species (4-letter codes)	Number of Stations	Number of Transects
Boreal Chorus Frog (BCFR)	153	29
Wood Frog (WOFR)	20	14
Columbia Spotted Frog (SPFR)	2	2
Northern Leopard Frog (NLFR)	1	1
Western (Boreal) Toad (BOTO)	11	8
Canadian Toad (CATO)	9	5
Great Plains Toad (GPTO)	1	1
Plains Spadefoot (PLSP)	4	4
***All Amphibians**	**187**	**37**

* Multiple species heard at some point counts and transects.

The boreal chorus frog was the most widespread and abundant species, and was recorded on 29 transects at 153 stations (Tables 2 and 3, Appendix D). There were two stations that had three species of amphibians and 26 stations that had two species of amphibians. The detection rate (detections/stations surveyed) for boreal chorus frogs was quite high during the surveys, however all other species were recorded infrequently. The species that were targeted for surveys (plains spadefoot, Great Plains toad, and Canadian toad) were found at few locations, and were detected in low numbers with only one or two individuals observed at each station (Tables 2 and 3, Figure 2).

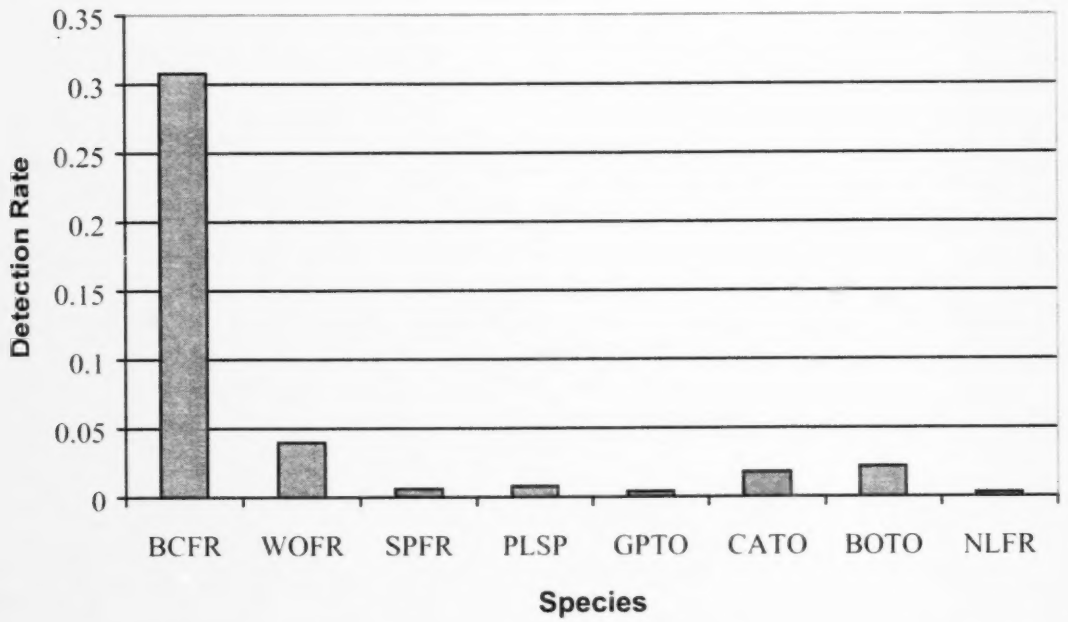

Figure 2. Detection rate (number of active stations/total number of stations surveyed) for transect surveys (see Table 2 for 4-letter codes).

In total there were 202 amphibian detections made while call surveys were conducted. Boreal chorus frogs represented 76%, Columbia spotted frogs represented 1%, northern leopard frogs represented 0.5%, western toads represented 5%, Canadian toads represented 4%, Great Plains toads represented 0.5%, and plains spadefoots represented 2% of the total amphibian detections.

Table 3. Number of stations with different abundances of amphibians recorded.

Species	***Abundance Code**		
	1	**2**	**3**
Boreal Chorus Frog	46	49	58
Wood Frog	13	7	0
Canadian Toad	7	2	0
Western Toad	5	6	0
Plains Spadefoot	4	0	0
Columbia Spotted Frog	2	0	0
Northern Leopard Frog	1	0	0
Great Plains Toad	1	0	0

* Abundance Code – 1=Individuals can be counted, space between calls, 2=Calls can be distinguished but some overlap, and 3= full chorus, calls are constant, continuous and overlapping

Separating the prairie data from forested region data shows that there were far fewer amphibians recorded in the prairies. Amphibians were recorded at 53 of 169 stations (31.4%) on prairie transects, and at 133 of 328 stations (40.5%) in forested regions.

4.2 Environmental Conditions

4.2.1 Point Counts

Point count surveys were conducted between June 14 and July 11, 2001. Stations were surveyed at various times throughout the day and night, although most were conducted during the afternoon. Amphibians were recorded less frequently from 12:00 to 15:59, than the other four hour time intervals (Table 4).

Table 4. Amphibian detection rate at various time intervals.

Time	**Number of Stations Surveyed**	**Number With Amphibians**	**Percent**
0:00 – 3:59	1	1	100.0
12:00 – 15:59	9	2	22.2
16:00 – 19:59	8	6	75.0
20:00 – 23:59	4	3	75.0

Temperatures ranged from 13.0 to 30.5°C during point count surveys (average 20.6°C), however most of the amphibians were heard at temperatures between 13.0 and 21.0°C. One plains spadefoot was heard calling at 25.0°C, but no other amphibians were heard calling at warmer temperatures. Wind speed did not appear to affect the detection rate (number of active stations/ total number of stations surveyed) during point counts, and amphibians were heard at wind speeds above Beaufort Scale of three (Table 5). Sample size, however, was quite low (n=22).

Table 5. Number of stations surveyed and number with amphibians recorded at different wind speeds (Beaufort Scale).

Wind Speed	Number of Stations Surveyed	Number With Amphibians
0	1	0
1	5	1
1.5	5	5
2	5	3
2.5	4	1
3	0	0
3.5	2	2

4.2.2 Transects

There were ten transects surveyed in May (30% of stations had amphibians), 33 in June (55.7% of stations had amphibians), and seven in July (8.6% of stations had amphibians), 2001. The earliest survey was on May 1 and the latest survey was on July 16. Fewer amphibians were heard earlier in the night than later (Table 6).

Table 6. Number of transect stations surveyed and number detection rates at different times of the night.

Time	Number of Stations Surveyed	Number With Amphibians	Percent
20:00 – 21:59	140	48	34.3%
22:00 – 23:59	267	121	45.3%
0:00 – 1:59	90	49	54.4%

Detection rate did not seem to be influenced by sky condition (Table 7). Amphibians were heard calling on clear days and completely overcast days. Fewer amphibians were heard calling during rainfall events, however many amphibians were heard calling soon after rainfall.

Table 7. Rate of detection on transect surveys with various sky conditions.

Sky Codes	Description	Number of Stations	Detection Rate
0	Clear, few clouds	109	0.55
1	Partly cloudy	204	0.30
2	Cloudy or overcast	176	0.52
5	Drizzle or light rain	8	0.25

Temperature also affected detection rate, with the 10.0 to 14.0°C range being the optimum time to survey in order to record the greatest number of amphibians (Figure 3). No amphibians were recorded calling when temperatures were above 24°C, although western toads were heard calling at temperatures at low as 1.0°C. Wind speed had an effect on detection rate. At a Beaufort Scale of three and higher, fewer amphibians were heard calling (Table 8, Figure 4). This could be due to the observer not being able to detect the amphibians due to noise, or the amphibians not calling in these conditions.

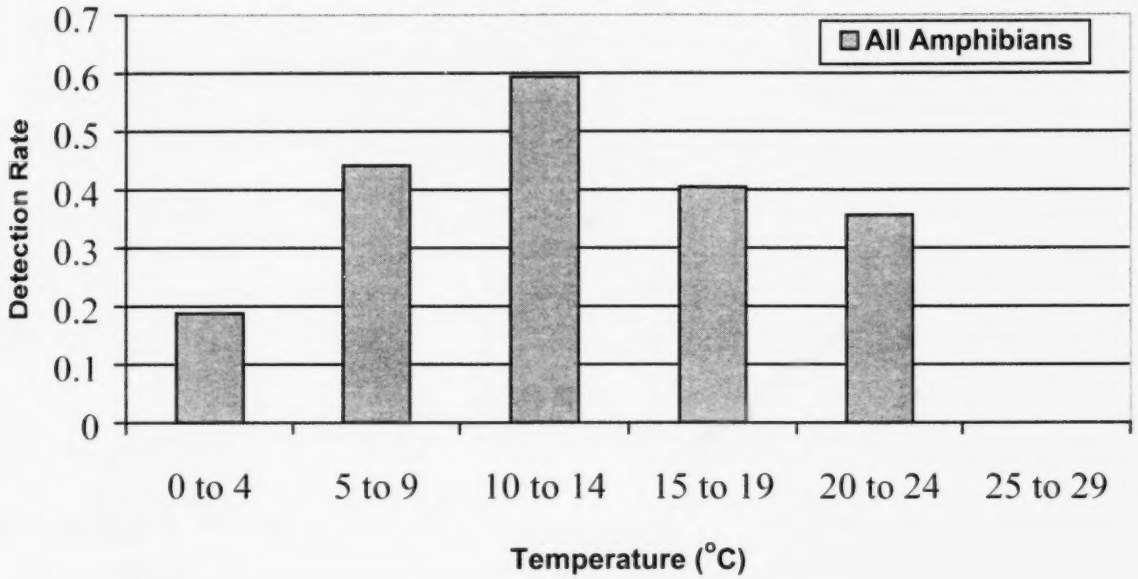

Figure 3. Detection rate of amphibians at different 5 degree Celsius ranges of temperature.

Table 8. Wind speed (Beaufort Scale) during transect station surveys and number of stations with amphibians (detection rate).

Wind Speed	Number of Stations Surveyed	Number With Amphibians
0	91	57 (0.63)
1	128	74 (0.58)
1.5	29	16 (0.55)
2	61	32 (0.53)
2.5	21	9 (0.43)
3	43	10 (0.23)
3.5	36	8 (0.22)
4	48	9 (0.19)
4.5	16	3 (0.21)
5	7	0 (0.0)
5.5	10	1 (0.10)
6	7	0 (0.0)

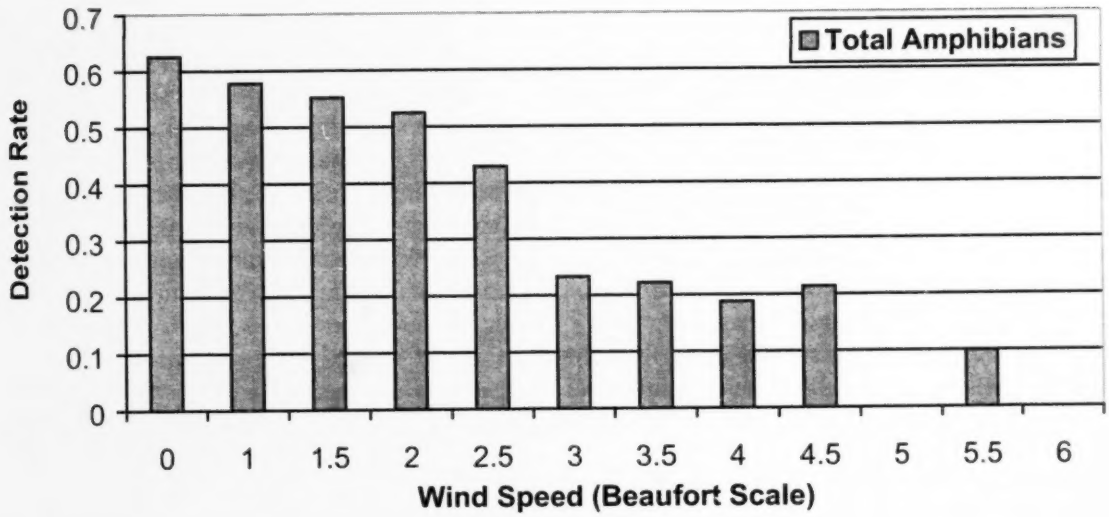

Figure 4. Detection rate at different wind speeds (Beaufort Scale).

4.3 Ground Truthing

Forty-six ponds along 18 transects were ground truthed (Appendix E). These numbers, however, do not reflect the number of transects that were visited for ground truthing purposes. Often, surveyors returned to transects to find that either the ponds along them had dried up since the time when call surveys were conducted, or landowner access permission was not granted (due to not being able to find the landowner or the landowner not allowing access.

Figure 5. Boreal chorus frog young-of-year at Elk Island National Park (photo by Gill Priestley).

Comparisons of the call survey, and ground truthing data were made (Appendix F). Only three transects did not have amphibians detected during either call surveys or ground truthing. Amphibians were detected on both call surveys and ground truthing at 11 sites (Figure 5). Amphibians were detected during call surveys but not during ground truthing on four sites, and there were no cases where amphibians were detected while ground truthing but not while conducting call surveys.

In some cases, detection of amphibian species differed between call surveys and ground truthing. Six species (wood frog, boreal chorus frog, Columbia spotted frog, Canadian toad, plains spadefoot and western toad) were detected along seven transects while conducting call surveys but not while conducting ground truthing. Three species (wood frog, Columbia spotted frog and western toad) were detected along two transects while conducting ground truthing but not while conducting call surveys. Species detections, while conducting call surveys and ground truthing, were consistent along four transects.

5.0 DISCUSSION

The NAAMP protocol has the potential to become a tool that will help researchers determine an index of population abundance and population trends of some Alberta amphibian species. The protocol will have to be modified for detecting some of the more irruptive species and for surveying in drier prairie regions. Researchers also will not able to determine year to year productivity using this protocol. Hearing vocalizing amphibians during the breeding season suggests that adults are initiating breeding but nothing can be inferred about the success of breeding initiations (females attracted by calling males, amplexis was initiated, eggs were fertilized, larvae hatched, larvae went through metamorphosis, young dispersed successfully).

Amphibians were often detected in the forested regions of the study areas, however, amphibian detections on the prairies were quite low. Far fewer amphibians were found on the prairies due to the more arid conditions of that area. Often randomly set surveys only had one or two ponds along them in the prairies. This was in direct contrast with randomly set transects in forested regions that would be in close proximity to half a dozen or more ponds. It appears that it would be more beneficial to pursue the use of yearly point counts at known wetlands in the prairie region. To increase call detection rates in the forested regions, it may also be beneficial to use point counts at wetlands instead of using transects along roads. Using a random stratification based on wetland habitat would ensure coverage focused on potential habitat available for amphibians. Once important breeding ponds are identified for species with lower abundances or species that are concentrated in specific sites, these wetlands could be monitored more intensively year to year. A minimum of five to ten years would be required for species that have high variability (Droege 2002).

Figure 6. Dry pond near Dinosaur Provincial Park. (photo by Lisa Takats)

Some species (ie. boreal chorus frog) were frequently detected in high abundance using call surveys while other species were not (Columbia spotted frog, Canadian toad, Great Plains toad, plains spadefoot, northern leopard frog). This is important to note because all three of the target species for this study (Canadian toad, Great Plains toad and plains spadefoot) were detected in low numbers. The low detection rate could reflect lower overall population abundances compared to other species such as the boreal chorus frog and/or limitations in the effectiveness of the protocol to detect the target species.

Overall, the drought conditions had a huge impact in our ability to test the call survey protocol (Appendix G). However, this was beneficial in that it tested the protocol in extreme environmental conditions.

"Over vast areas of the province, hot, dry, windy conditions dried up the sloughs . . . "

" The summer of 2001 wasn't just hot, it was one of the driest in decades and according to Environment Canada, one of the most extensive in history affecting almost every corner of the country." (Sheane and MacIntosh 2001).

Environmental conditions affected the detection of amphibians during call surveys. The protocol requires that surveys be conducted between 20:00 and 1:00. We found that the highest detection rate occurred between 0:00 and 1:59 and the lowest detection rate occurred between 20:00 and 21:59. It appears that it would be more beneficial for surveyors to conduct their surveys later in the night (time of night would be directly related to the temperature; as time of night gets later, temperature decreases). Temperature is one of the most important factors influencing the activity of amphibians (Heyer *et al.* 1994). Even though surveys were conducted between 13.0 and 30.5°C most amphibians were detected between 13.0 and 21.0°C. Therefore, surveyors should try to sample somewhere in this temperature range to detect the highest number of amphibians. Wind speed affected detection rate during transect surveys, however this was probably due to the researcher's inability to hear amphibians calling. Sky condition did not appear to affect the detection rate, and amphibians were heard less frequently during rain events. This could be due to the sound of rainfall impeding the researcher's ability to hear the amphibians. Heavy rainfall, however, is a cue for species in arid regions to initiate breeding.

Ground truthing was conducted to determine whether surveyors detected all the species of frogs and toads present in wetlands during the call surveys. We also wanted to determine whether certain species were being missed during call surveys. Overall the call survey protocol used by surveyors in this study is an effective method for detecting some, but not all, species. Additionally, call surveys appeared to be more effective for detecting relatively common species.

Three species (wood frog, Columbia spotted frog and western toad) were detected during ground truthing but not while conducting call surveys. During call surveys, these species were known to have been missed on at least one transect for each of these species. However, few transects were located in the range of the Columbia spotted frog (three transects located in known range) and the western toad (4 transects located within known range) (Russell and Bauer 2000). Future work may be required to address the effectiveness of call surveys for these species with particular focus on the Columbia spotted frog (listed at *Sensitive*) and the western toad (listed as *Sensitive*). It is important to note that none of the three species that were missed were targets for this project.

Six species (wood frog, boreal chorus frog, Columbia spotted frog, Canadian toad, plains spadefoot, and western toad) were detected using call surveys but were missed when ground truthing was conducted along seven transects. Two target species (Canadian toad and plains spadefoot) were included in this list.

The Canadian toad was found in Elk Island National Park (central Alberta) where the species was described as being common, however recent information suggests that numbers may be declining (Roberts 1992). The combination of its low abundance in the park, the fact that their populations are not highly concentrated in particular areas (Elk Island has abundant wetlands), and their cryptic nature could explain why researchers did not find this species during ground truthing (Hamilton *et al.* 1998). This could indicate that conducting the call survey protocol is a time-effective way to monitor species of low abundance or to get a better idea about what is present in areas where populations are not concentrated in any one area, however a better understanding of breeding (calling) phenology is required.

The plains spadefoot, a species that spends most of its time underground (Bragg 1965, Baxter and Stone 1980, Lauzon 1999), was heard along a transect a couple of days after heavy rainfall but was missed when ground truthing was conducted (a few weeks after rain). Plains spadefoots are

well adapted to dry conditions and will only emerge after 2.5 to 10.4 cm of rain has fallen (Black 1970, Farrar and Hey 1995). It is possible that the adult had initiated breeding vocalizations after the rain but due to the extremely dry conditions in the area, was unsuccessful at either attracting a mate or producing any young. Call surveys can be a good method for detecting burrowing species that live in arid environments like the plains spadefoot, but choosing when call surveys will be conducted for these species must be a crucial consideration (Didiuk, pers. comm.).

Rainfall is also an important stimulus for initiation of breeding and for creation of breeding habitat for the Great Plains toad (Bragg and Smith 1942, Kruppa 1994, James 1998). This species will not breed when no significant rainfall occurs, and this was reflected in the data (only one Great Plains toad was recorded during surveys).

6.0 MANAGEMENT IMPLICATIONS AND FUTURE DIRECTIONS

Overall the call surveys work were successful for species that are abundant in Alberta. The effort (time) required to conduct the surveys is small for the return of good information.

Recommendations for future work include:

1) Having volunteers participate in a call survey would better standardize data collection. Presently 270 volunteers send in data (for the Amphibian Monitoring Program) that is not standardized, and that only contributes to distribution and phenology information. There are some keen volunteers that send in huge amounts of data. These people may be willing to participate in a more standardized survey technique, such as call surveys (see point 5 below). Other volunteers still collect meaningful distribution and phenology, and the educational component to the program is important.

2) Canadian toads calling has been recorded over two months in Alberta, and the cues for calling initiation are not well known, therefore timing surveys would be difficult. More intensive surveys may be required to better understand Canadian toad phenology.

3) Precipitation strongly influences amphibian activity, distribution and dispersion patterns, and reproductive cycles (Heyer *et al.* 1994). Volunteer call surveys could still work for Great Plains toads and plains spadefoots, however they need to be conducted shortly after heavy rainfall (minimum 2.5 cm). If volunteers are assigned to well known breeding sites and conduct surveys soon after rainfall this monitoring technique should be successful. At least two surveys should be conducted, to ensure the highest calling intensity is recorded.

4) The NAAMP protocol will not detect salamander species because salamanders do not vocalize during the breeding season.

5) Finally, there is a new program called the Marsh Monitoring Program being developed for the Prairie Provinces (Manitoba, Saskatchewan and Alberta) through Bird Studies Canada (http://www.bsc-eoc.org/bscmain.html). This program aims to collect information on amphibians and marsh birds using call surveys. This program will develop a survey protocol over the next year (in consultation with organizations interested in this information), and will then implement it using volunteers. This program can be run cooperatively with the existing Alberta Amphibian Monitoring Program to share information.

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USGS

Alberta Conservation Association

Alberta ENVIRONMENT

Alberta Amphibian Monitoring Program

Appendix A

North American Amphibian Monitoring Program (NAAMP)

Observer Number:	

Route Information

Route Number:		Route Name:		State:	AB	Survey Date:		Run Number:	

Observer Information

First Name:		MI:		Last Name:	

Please complete address or contact information in boxes below, only if it has changed.

Street Address 1:		Street Address 2:	

City:		State:		Zip:	

Phone:		e-mail:	

Directions

Be sure to complete the whole datasheet, don't forget the Date and Run Number above. At the start and finish of each run record the time, windspeed, and sky code. At each stop listen for 5 minutes, then record the amphibian calling index for each species heard and the additional requested information.

There are two kinds of noise disturbance questions:

"Was noise a factor?" means did background noise impact your ability to hear

"Did you take a time out?" if an unexpected noise disturbance happens (such as a train) that lasts a minute or more, you may interrupt the 5 minute listening period to ignore the sudden disturbance, finish up the listening time after the disturbance has passed. Do not include this type of noise in the "was noise a factor" question.

Index and Code Definitions

Amphibian Calling Index

1 = Individuals can be counted; there is space between calls

2 = Calls of individuals can be distinguished but there is some overlapping of calls

3 = Full chorus, calls are constant, continuous and overlapping

Sky Codes

0 = Few clouds

1 = Partly cloudy (scattered) or variable sky

2 = Cloudy or overcast

4 = Fog or smoke

5 = Drizzle or light rain (not affecting hearing ability)

7 = Snow

8 = Showers (is affecting hearing ability) *do not conduct survey*

Beaufort Wind Codes

0 = Calm (<1mph) smoke rises vertically

1 = Light Air (1-3 mph) smoke drifts, weather vane inactive

2 = Light Breeze (4-7 mph) leaves rustle, can feel wind on face

3 = Gentle Breeze (8-12 mph) leaves and twigs move around, small flag extends

4* = Moderate Breeze (13-18 mph) moves thin branches, raises loose papers

**do not conduct survey* at Level 4, unless in Great Plains region

5** = Fresh Breeze (19 mph or greater) small trees begin to sway

***do not conduct survey* at Level 5, ALL REGIONS

Additional Notes (days since last rainfall, start point information, etc.)

--Please turn over to continue filling in survey form --

Per Stop Information

Stop #	1	2	3	4	5	6	7	8	9	10
Latitude										
Longitude										
Start Time (Military)										
Air Temperature (°C)										
Sky Code										
Wind (Beaufort Scale)										
Was noise a factor?										
Did you take a timeout?										

Species ↓ / Stop # →	1	2	3	4	5	6	7	8	9	10
Boreal Chorus Frog										
Wood Frog										
Canadian Toad										
Boreal Toad										
Plains Spadefoot										
Great Plains Toad										
Northern Leopard Frog										
Columbia Spotted Frog										
Other Species:										
Check if Snow Cover: (optional)										
# of cars that passed: (optional)										

If you have any additional notes, please write them in the box provided on the front of this sheet. Thank you for your participation!

Appendix B

Locations of Point Counts

Number	Location Name	Location
RPC 1	Amisk Creek	53° 21' 8.3" / 112° 33' 22.4"
RPC 2	Lavoy	53° 28' 40.9" / 111° 56' 35.4"
RPC 3	Birch Lake turnoff	53° 22' 2.0" / 111° 31' 46.4"
RPC 4	Innisfree	53° 20' 11.5" / 111° 30' 59.2"
RPC 5	South Birch Lake	53° 18' 24.8" / 111° 31' 38.9"
RPC 6	Birch Lake	53° 17' 41.1" / 111° 30' 59.0"
RPC 7	Birch Lake east	53° 16' 40.4" / 111° 36' 25.7"
RPC 8	Birch Lake southwest	53° 16' 38.2" / 111° 45' 13.6"
RPC 9	Cooking Lake east	53° 36' 42.8" / 112° 46'44.5"
RPC 10	Cooking Lake south	53° 30' 44.1" / 113° 00' 19.5"
RPC 11	Coronation	52° 5' 22.1" / 111° 27' 23.1"
RPC 12	Patricia	50° 41' 54.4" / 111° 39' 58.9"
RPC 13	Rolling Hills area	50° 23' 50.9 / 111° 47' 17.8"
RPC 14	Hanna northeast	51° 50' 7.3" / 111° 50' 52.3"
RPC 15	Veteran	51° 59' 51.5" / 111° 4' 19.5"
RPC 16	884	51° 51' 9.9" / 111° 9' 50.0"
RPC 17	Youngstown	51° 34' 44.5 / 111° 6' 24.6"
RPC 18	Youngstown south 1	51° 20' 2.0" / 111° 12' 1.1"
RPC 19	Youngstown south 2	51° 16' 12.6" / 111° 11' 48.5"
RPC 20	Iddesleigh	50° 39' 34.7" / 111° 20' 52.7"
RPC 21	Millicent	50° 41' 25.3" / 111° 44' 8.5"
RPC 22	Loon Lake (Opal area)	53° 54' 52.2" / 113° 13' 25.2"

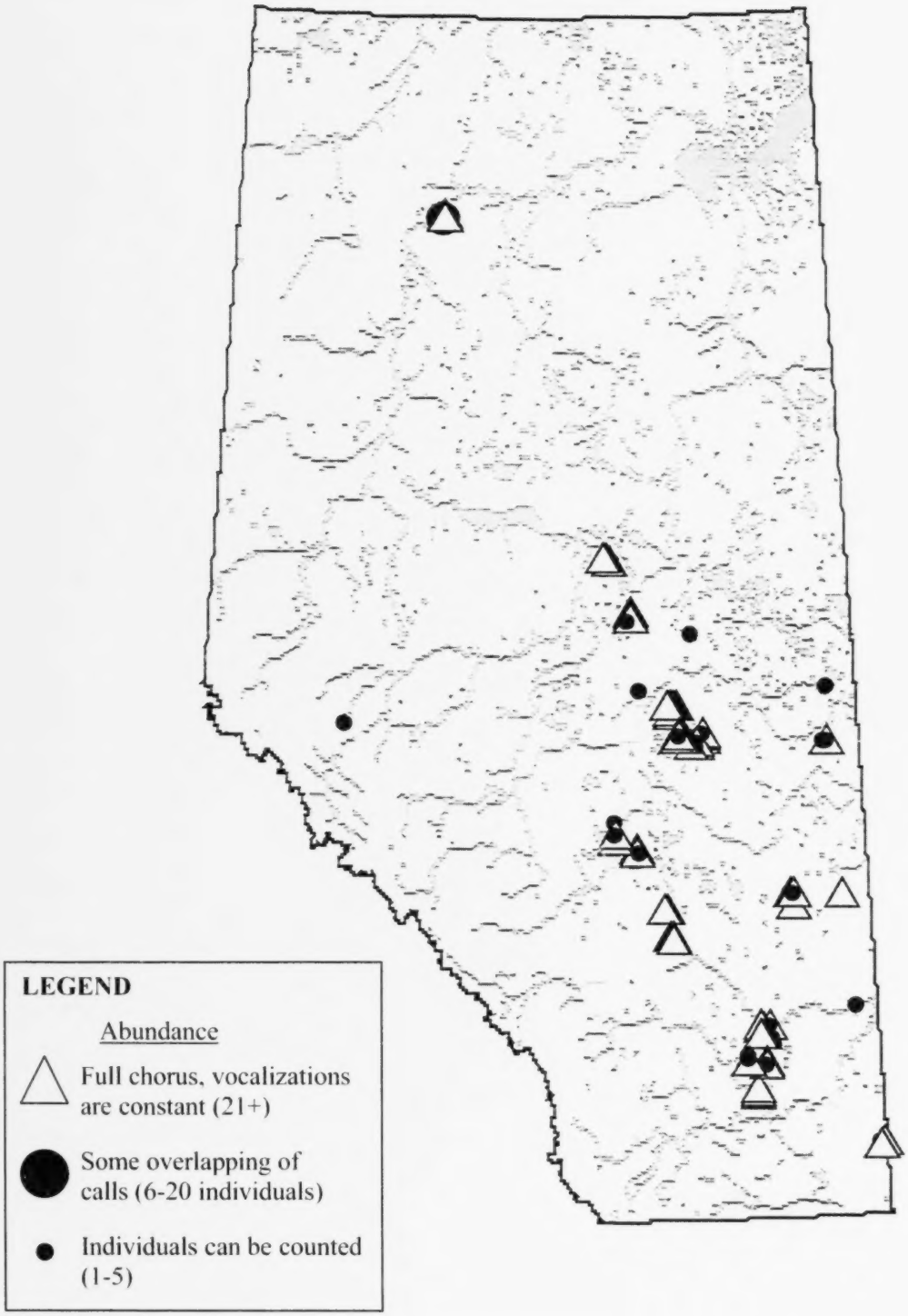
Appendix C

Call Survey Locations

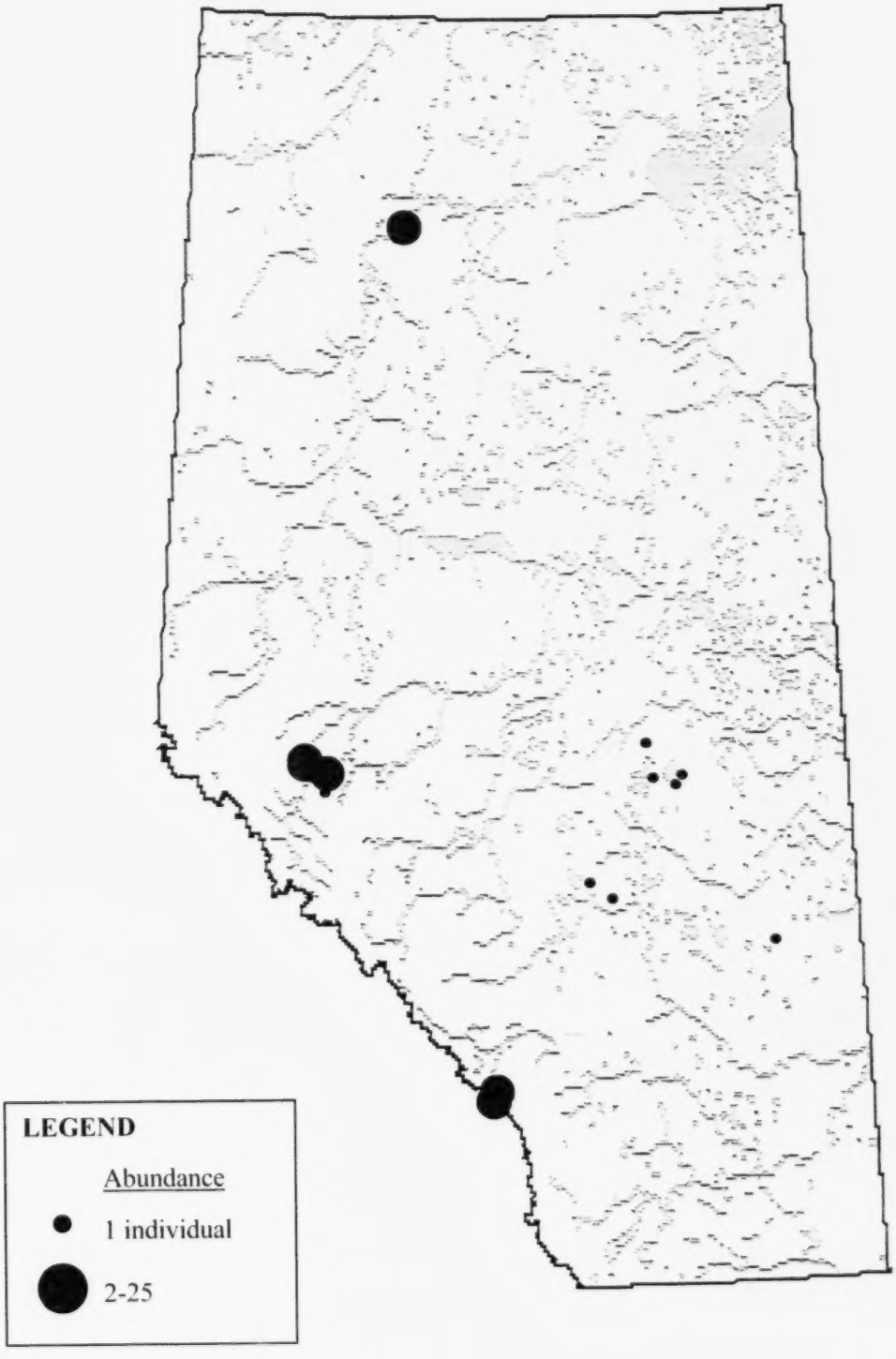
#	Name	Start Point	End Point
1	Frog Lake	53° 48' 8.6" / 110° 27' 3.5"	53° 49' 53.2" / 110° 23' 19.1"
2	Islay	53° 35 51.5 / 110° 32' 48.4"	53 ° 30' 41.8" / 110° 32' 48.1"
3	Kenilworth Lake	53° 14' 55.8" / 110° 35' 50.2"	53° 14' 56.1"110° 33' 10.8"
4	Lilly Lake	53° 55 11.8" / 113° 28' 17.6"	53° 52' 5.8" / 113° 26' 48.1"
5	Bon Accord	53° 49' 16.2" / 113° 23' 48.5"	53° 51' 42.5" / 113° 21' 11.7"
6	Starland	51° 50'15.0" / 113° 00' 45.8"	51° 49' 25.3" / 113 7' 23.2"
7	Huxley	51° 54' 39.5" / 110 26' 27.8"	51° 56' 20.0" / 110° 24' 22.3"
8	Kneehill	51 35' 26.1" / 112 57' 42.2"	51° 32' 2.4" / 112° 53' 22.7"
9	Elk Island	53° 37' 7.1" / 112° 52' 29.1"	53° 39' 31.7" / 112° 51' 24.6"
10	Elk Island North	53° 42' 59.1 / 112° 48' 11.9"	53° 42' 58.7" / 112° 55' 5.0"
11	South Clive	52° 24' 15.6" / 113° 26' 7.6"	52° 22' 35.2" / 113° 22' 29.5"
12	Lacombe College	52° 28' 39.9" / 113° 44' 53.9"	52° 32' 24.4" /113° 44' 50.3"
13	Hemaruka	51° 51' 9.8" / 111° 13' 36.4"	51° 51' 9.9" / 111° 6' 32.2"
14	South Veteran	51° 58' 7.4" / 111° 11' 9.9"	51° 56' 47.4" / 111° 6' 55.4"
15	Dinosaur Provincial Park	50° 45' 40.2" / 111° 31' 27.5"	50° 45' 28.0" / 111° 36' 31.5"
16	North Patricia	50° 42' 3.4" / 111° 40' 1.0"	50° 46' 10.4" / 111° 41' 22.4"
17	Princess	50° 38' 17.6" / 111° 27' 30.2"	50° 39' 4.6' / 111° 32' 32.2"
18	South Patricia	50° 41' 18.8" / 111° 35' 49.6"	50° 41' 18.8" / 111° 42' 30.0"
19	South Rolling Hills	50° 7' 52.4" / 111° 46' 33.7"	50° 11' 42.6" / 111° 46' 43.2"
20	Prairie Trail	50° 23' 49.6" / 111° 53' 0.6"	50° 20' 2.2" / 111° 53' 42.1"
21	Tilley	50° 26' 34.7" / 111° 39' 15.3"	50° 23' 50.8" / 111° 42' 0.7"
22	Kinbrook Island	50° 26' 45.7" / 111° 54' 18.2"	50° 29' 55.9" / 111° 52' 59.5"
23	Sandy Point	50° 50' 55.4" / 110° 8' 35.9"	50° 58' 2.6" / 110° 6' 22.5"
24	Hilda	50° 29' 4.6" / 110° 1' 54.7"	50° 30' 38.8" / 110° 5' 47.6"
25	Bindloss	50° 52' 40.5" / 110° 16' 54.3"	50° 56' 28.7" / 110° 18' 25.8"
26	North Ryley	53° 23' 45.6" / 112° 23' 12.1"	53° 27' 41.6" / 112° 23' 9.2"
27	Amisk Creek	53° 21' 8.1" / 112° 33' 44.6"	53° 22' 0.8" / 112° 28' 29.6"
28	Hastings Creek	53° 23' 45.2" / 112° 40' 52.5"	53° 23' 46.0" / 112° 47' 30.1"
29	East Lindbrook	53° 26' 48.2" / 112° 40' 52.0"	53° 25' 30.9" / 112° 45' 11.3"
30	Whitford Lake	53° 50' 45.7" / 112° 12' 29.4"	53° 49' 53.1" / 112° 18' 24.1"
31	Kananaskis 1	5620000N / 633540E	5617180N / 630320E
32	Kananaskis 2	5641970N / 631300E	5836450N / 628510E
33	Kananaskis 3	5608900N / 633100E	5614590N / 633010E
34	Gregg Lake	53° 31' 52.2" / 117° 48' 13.9"	53° 35' 58.9" / 117° 43' 34.5"
35	Cold Creek	53° 21' 13.1" / 117° 34' 29.5"	53° 16' 5.1" / 117° 29' 57.3"
36	Pedley	53° 25' 53.2" / 117° 32' 18.4"	53° 29' 7.8" / 117° 23' 11.8"
37	Blackcat Ranch	53° 22' 18.6" / 117° 45' 36.0"	53° 23' 21.4' / 117° 52' 54.4"
38	Battle Creek	5501300N / 569700E	5499420N / 565630E
39	La Crete (volunteer)	6451200N / 531880E	6447280N / 530590E
40	Athabasca 1 (volunteer)	54° 34.47' / 113° 27.55'	54° 27.51' / 113° 29.04'
41	Athabasca 2 (volunteer)	55° 1.18' / 113° 41.95'	55° 4.02' / 113° 52.20'

Appendix D

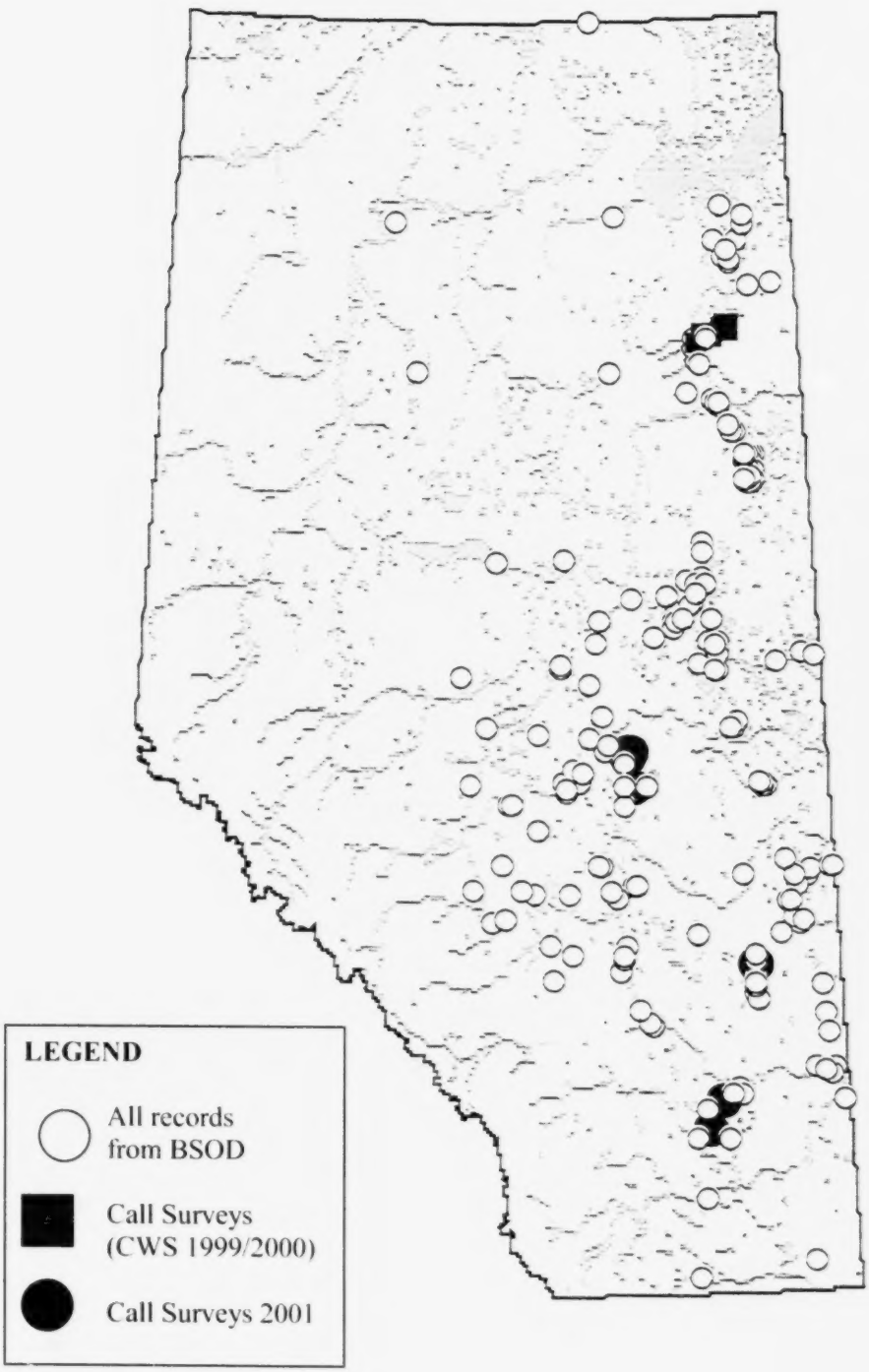
Maps of amphibian locations from call surveys 2001



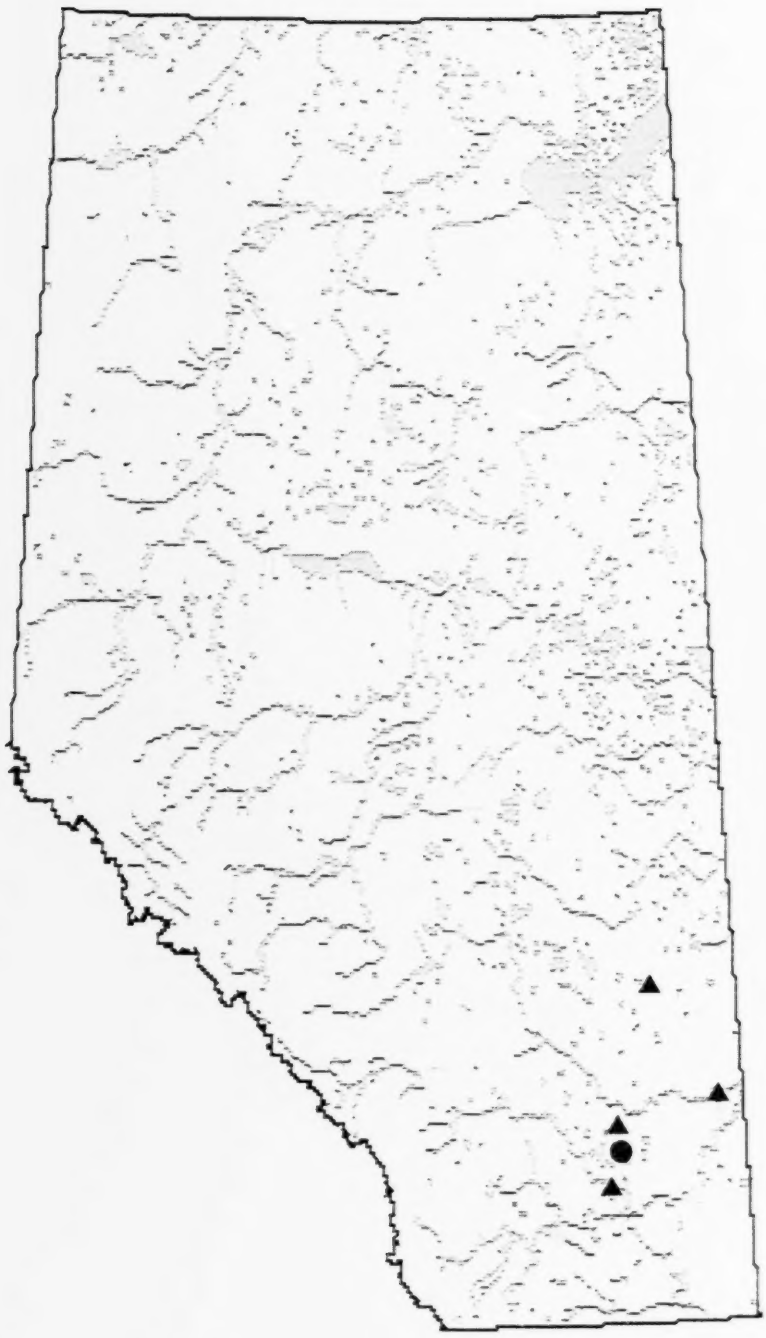
Boreal Chorus Frogs (abundance) recorded during call surveys.



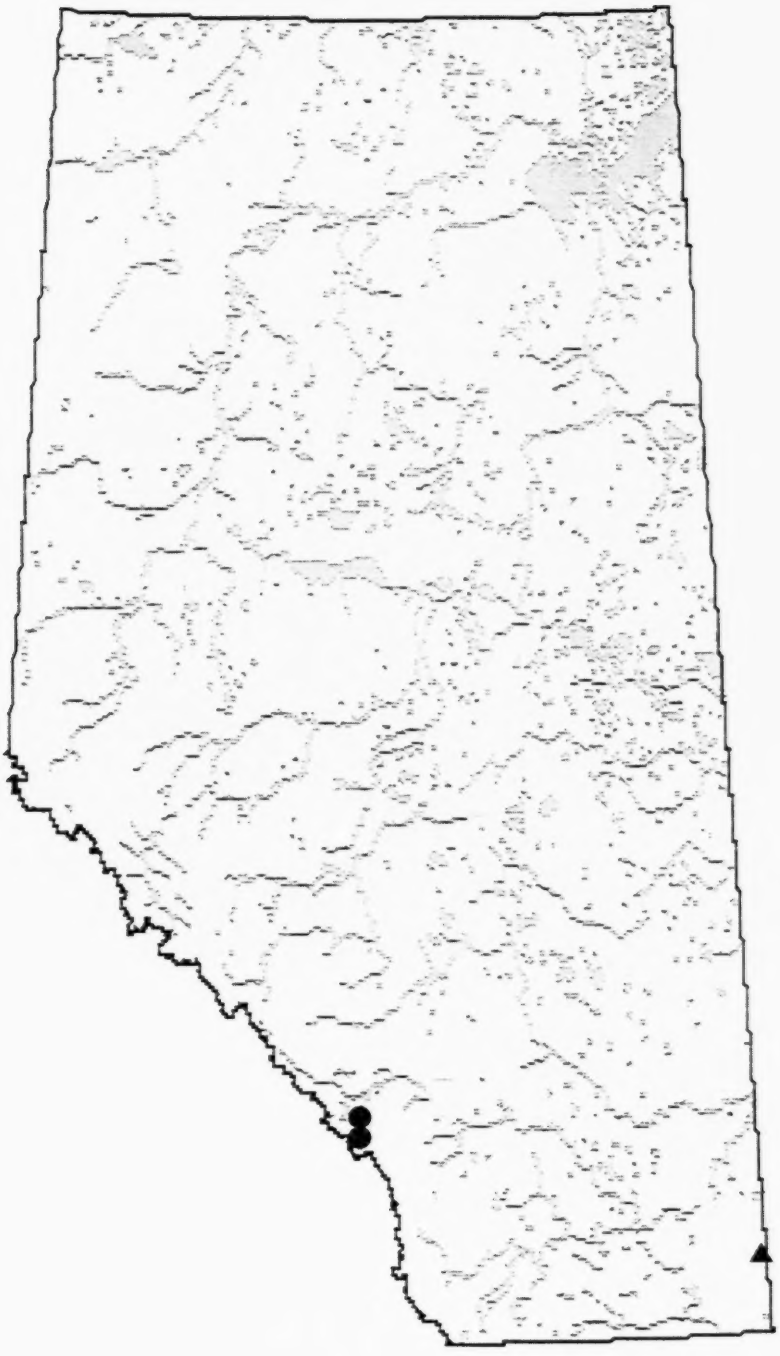
Wood Frogs recorded during call surveys 2001.



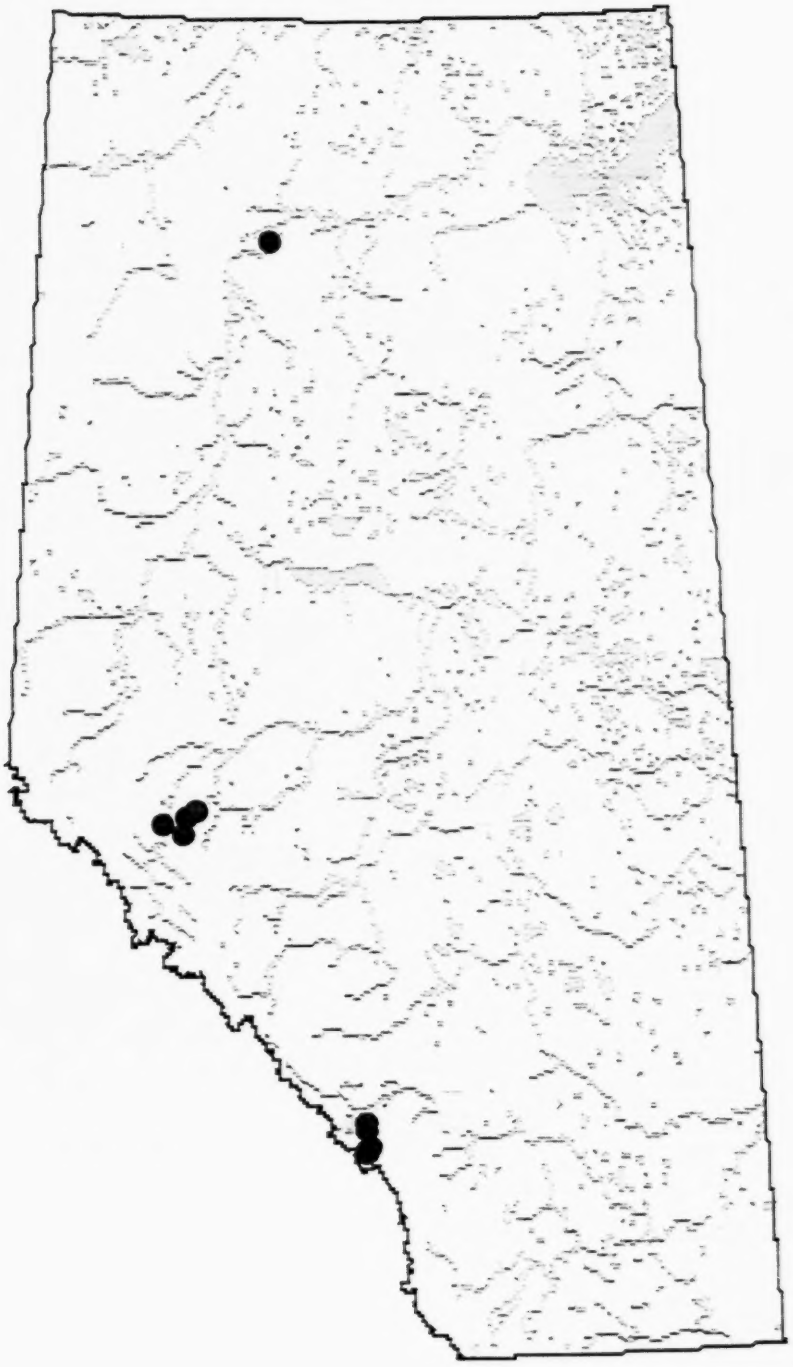
Map of all Canadian Toad records and new call survey records.



Map of Great Plains Toad (●) and Plains Spadefoot (▲) records from call surveys.



Columbia Spotted Frogs (●) and Northern Leopard Frog (▲) recorded during call surveys 2001.



Western Toads recorded on call surveys in 2001.

Appendix E

Number of Call Survey and Ground Truth Visits for Each Transect

#	Name	Number of Call Surveys Conducted	Number of Ponds Ground Truthed
1	Frog Lake	2	3
2	Islay	1	1
3	Kenilworth Lake	1	1
4	Lilly Lake	2	*0
5	Bon Accord	2	*0
6	Starland	1	0
7	Huxley	1	0
8	Kneehill	1	0
9	Elk Island	2	5
10	Elk Island North	1	0
11	South Clive	2	2
12	Lacombe College	2	2
13	Hemaruka	1	1
14	South Veteran	1	*0
15	Dinosaur Provincial Park	1	*0
16	North Patricia	1	2
17	Princess	1	*0
18	South Patricia	1	*0
19	South Rolling Hills	1	1
20	Prairie Trail	1	2
21	Tilley	1	*0
22	Kinbrook Island	1	1
23	Sandy Point	1	*0
24	Hilda	1	2
25	Bindloss	1	*0
26	North Ryley	2	4
27	Amisk Creek	2	3
28	Hastings Creek	1	*0
29	East Lindbrook	1	*0
30	Whitford Lake	1	0
31	Kananaskis 1	2	5
32	Kananaskis 2	1	3
33	Kananaskis 3	1	2
34	Gregg Lake	1	0
35	Cold Creek	1	0
36	Pedley	1	0
37	Blackcat Ranch	1	0
38	Battle Creek	1	6
39	La Crete (volunteer)	1	0
40	Athabasca 1 (volunteer)	1	0
41	Athabasca 2 (volunteer)	1	0

*Transect revisited but either ponds were dried up, or landowner access permission was not given.

Appendix F

Species Comparison of Call Survey and Ground Truthing Observations

#	Name	Species Observed During Call Surveys	Species Observed During Ground Truthing
1	Frog Lake	None	None
2	Islay	BCFR	None
3	Kenilworth Lake	BCFR	None
9	Elk Island	BCFR, CATO	WOFR, BCFR, BOTO
11	South Clive	WOFR, BCFR	BCFR
12	Lacombe College	WOFR, BCFR	WOFR
13	Hemaruka	BCFR, CATO, PLSP	None
16	North Patricia	BCFR	BCFR
19	South Rolling Hills	BCFR, PLSP	BCFR
20	Prairie Trail	None	None
22	Kinbrook Island	BCFR, CATO	None
24	Hilda	None	None
26	North Ryley	BCFR, WOFR	BCFR, WOFR
27	Amisk Creek	BCFR, WOFR	BCFR, WOFR
31	Kananaskis 1	WOFR, BOTO, CSFR	BOTO, WOFR
32	Kananaskis 2	BOTO, CSFR	BOTO, CSFR
33	Kananaskis 3	WOFR, BOTO	WOFR, CSFR
38	Battle Creek	BCFR, NLFR	NLFR

Appendix G - Photographs

Transect in Elk Island National Park.

Groundtruthing was difficult at times because landowners were difficult to find.

Fire hazard was extreme in southern Alberta.

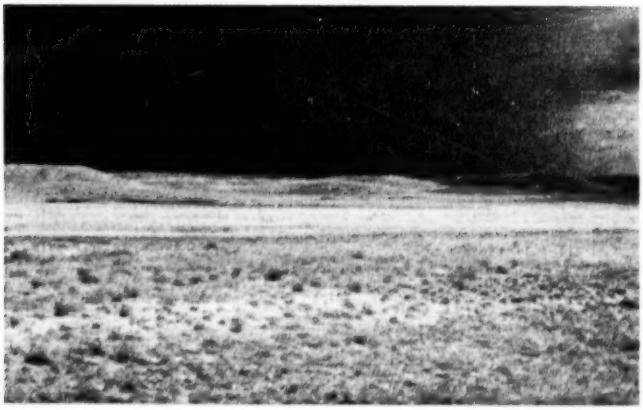


Photo of Bindloss transect habitat; only two stations had water along them.

Birch Lake was very dry this year.

List of Titles in This Series

(as of March 2002)

No. 1 Alberta species at risk program and projects 2000-2001, by Alberta Sustainable Resource Development, Fish and Wildlife Division. (2001)

No. 2 Survey of the peregrine falcon (*Falco peregrinus anatum*) in Alberta, by R. Corrigan. (2001)

No. 3 Distribution and relative abundance of the shortjaw cisco (*Coregonus zenithicus*) in Alberta, by M. Steinhilber and L. Rhude. (2001)

No. 4 Survey of the bats of central and northwestern Alberta, by M.J. Vonhof and D. Hobson. (2001)

No. 5 2000 survey of the Trumpeter Swan (*Cygnus buccinator*) in Alberta, by M.L. James and A. James. (2001)

No. 6 2000/2001 Brassy Minnow inventory at Musreau Lake and outlet, by T. Ripley. (2001)

No. 7 Colonial nesting waterbird survey in the Northwest Boreal Region – 2000, by M. Hanneman and M. Heckbert. (2001)

No. 8 Burrowing owl trend block survey and monitoring - Brooks and Hanna areas, by D. Scobie and R. Russell. (2000)

No. 9 Survey of the Lake Sturgeon (*Acipenser fulvescens*) fishery on the South Saskatchewan River, Alberta (June-September, 2000), by L.A. Winkel. (2000)

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